

REMARKS/ARGUMENTS

Claims 12-19 and 21-23 are present in this application. By this Amendment, claims 1, 19, 21 and 23 have been amended. Reconsideration in view of the above amendments and the following remarks is respectfully requested.

Claims 1, 19, 21 and 23 were objected to due to informalities. The noted informalities have been corrected by this Amendment. Withdrawal of the objections is requested.

Claims 12, 21 and 22 were rejected under 35 U.S.C. §103(a) over U.S. Patent No. 4,847,184 to Taniguchi et al. in view of U.S. Patent No. 5,719,372 to Togari et al. and U.S. Patent No. 6,160,835 to Kwon. This rejection is respectfully traversed.

As recognized by the Examiner, Togari teaches how to adjust the emission of a laser beam by directly varying operation of a modulator placed within a resonant cavity of the laser beam source (Fig. 3). Togari does not teach, however, that such a laser apparatus can be applied on a wooden support but only on an electronic component that has to be lined by a thermoplastic resin containing carbon to be vaporized by the laser beam. Furthermore, such a laser apparatus is applied to mark characters on an electronic component and not to transfer images in shades of gray to such support. The description clarifies that the pulse width of the laser beam, which is proportional to the intensity of the laser beam, is determined in advance, depending on the kind and/or thickness of the (thermoplastic) resin (col. 4, lines 25-27). Furthermore at col. 5, lines 9-15 and lines 46-50 or at col. 6, line 1 and lines 63-67, it is explicitly disclosed that the emission period and repetition rate may be determined depending on the kind of (thermoplastic) resin of the workpiece or depending on a desiderated material of the workpiece. This is construed to mean that, albeit the emission of the laser beam can be changed by directly varying operation of the modulator placed within a resonant cavity of the laser beam source, during a single

continuous marking process the intensity of the optical marking output is substantially constant, depending on the thickness and/or kind of the resin that clearly does not vary on the support surface, resulting in an energy per surface unit substantially constant so that no “shades of grey” can be obtained on a wooden object to be marked. As consequence of this, such laser apparatus is not really a laser scanner in the sense of the claimed invention, that is to say a device that is able to completely reproduce an image, but it is able to mark a surface by tracking lines having identical color intensity during a single marking process. Furthermore Togari is completely silent about the heat specific energy quantity provided for processing wooden supports.

For the abovementioned reasons, Togari cannot be combined with Taniguchi in order to arrive at the claimed solution.

Kwon discloses different laser scanning devices (see “Background of the Invention”) wherein the modulated output is accomplished by merely modulating the pump source (abstract and the entire description) and that operate at a pulse content from 0.01 to 1 joule/cm² (see col. 3, line 45-47, and col. 6, lines 28-29). Such laser scanning devices are not employed on wooden supports but are mainly applied onto a substrate of ceramics (col. 6, lines 37-40), having zirconia sintered surface (col. 4, lines 37-40), or onto a substrate of plastics (col.5, line 11), having an additive of Molybdenum disulfide (MoS₂) (col. 6, lines 40-44). This means that the pulse laser content from 0.01 to 1 j/cm² employed - in the particular examples disclosed in Kwon - for a substrate of ceramics and plastics cannot be automatically employed on a substrate of wood, as defined according to the claimed invention. Furthermore Kwon - referring to the scanning process - specifies that “In the working example of this invention the images were captured electronically with a digital bed scanner [...] converted to the appropriate dot density [...] and reduced to two colors by dithering to half tones.”

The above mentioned citation is construed to mean that, albeit the pulse laser content of the output can be changed by modulating the pump source, in contrast with the invention, during a single continuous marking process the intensity of the optical marking output is substantially constant resulting in an energy per surface unit substantially constant so that no “shades of grey” but just “two color gradation” can be obtained on a support to be marked. This is confirmed by the fact that Kwon underlines that “laser whose parameters can be readily adjusted, for example pulse content and pulse duration, permit the best possible adaptation to the requirements of the materials to be marked” (see col. 3, lines 55-59, and col. 6, lines 37-39). Therefore, the laser parameters are adjusted as a function of the materials to be marked, which is to say before the laser scanning process and not during the scanning process.

As consequence, the laser scanning devices disclosed in Kwon do not disclose a laser scanner in the sense of the claimed invention. That is, Kwon lacks a device that is able to completely reproduce images in “shades of gray” but rather is able to mark a surface just in two color gradation. Therefore Kwon does not teach to adjust the emission of the laser beam by directly varying the pumping of the active material during a single continuous marking in order to obtain images in shades of gray. Additionally, Kwon does not teach the application of energy per surface unit ranging from 0 to 43.7 j/cm^2 for marking/engraving a wooden support but rather teaches applying energy just to engraving plastic or ceramic supports.

Applicants thus submit that the rejection of independent claim 12 is misplaced.

With regard to dependent claims 21 and 22, Applicants submit that these claims are allowable at least by virtue of their dependency on an allowable independent claim.

Reconsideration and withdrawal of the rejection are respectfully requested.

Claims 13 and 15 were rejected under 35 U.S.C. §103(a) over Taniguchi in view of Togari, Kwon and U.S. Published Patent Application No. 2005/0006357 to Connor. Additionally, claim 14 was rejected over Taniguchi in view of Togari, Kwon, Connor and U.S. Published Patent Application No. 2002/0113829 to Nims et al., and claims 16 and 17 were rejected over Taniguchi in view of Togari, Kwon and U.S. Published Patent Application No. 2005/0083551 to McIlvaine. Still further, claim 18 was rejected over Taniguchi in view of Togari, Kwon and U.S. Patent No. 4,315,379 to Lang, and claim 19 was rejected over Taniguchi in view of Togari, Kwon and Japanese Patent Publication 2001-205463 to Nosaka et al. Without conceding these rejections, Applicants submit that these additional secondary references do not correct the deficiencies noted above with regard to Taniguchi, Togari and Kwon. As such, Applicants submit that these dependent claims are allowable at least by virtue of their dependency on an allowable independent claim. Withdrawal of the rejections is requested.

Claim 23 was rejected under 35 U.S.C. §103(a) over Taniguchi in view of Connor, U.S. Patent No. 6,624,883 to Zhou et al., Togari and Kwon. Claim 23 defines features of the method similar to those discussed above with regard to claim 12. As such, Applicants submit that at least Taniguchi, Togari and Kwon fall short of the invention defined in claim 23 in the context of those features that are shared in common with independent claim 12. Connor and Zhou do not correct the deficiencies noted with regard to Taniguchi, Togari and Kwon. As such, Applicants submit that claim 23 is similarly allowable. Withdrawal of the rejection is requested.

In view of the foregoing amendments and remarks, Applicants respectfully submit that the claims are patentable over the art of record and that the application is in condition for allowance. Should the Examiner believe that anything further is desirable in order to place the

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application in condition for allowance, the Examiner is invited to contact Applicants' undersigned attorney at the telephone number listed below.

Prompt passage to issuance is earnestly solicited.

The Commissioner is hereby authorized to charge any deficiency, or credit any overpayment, in the fee(s) filed, or asserted to be filed, or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to Deposit Account No. 14-1140.

Respectfully submitted,

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